

SERVICE MANUAL



SANYO

STEREO TURNTABLE

TP 440

(EUROPE)



NOTE:

SPECIFICATIONS

The below mentioned specifications are mainly based on the IHF measurements standard. They can therefore not directly be compared with specifications based on the DIN standard or other standards.

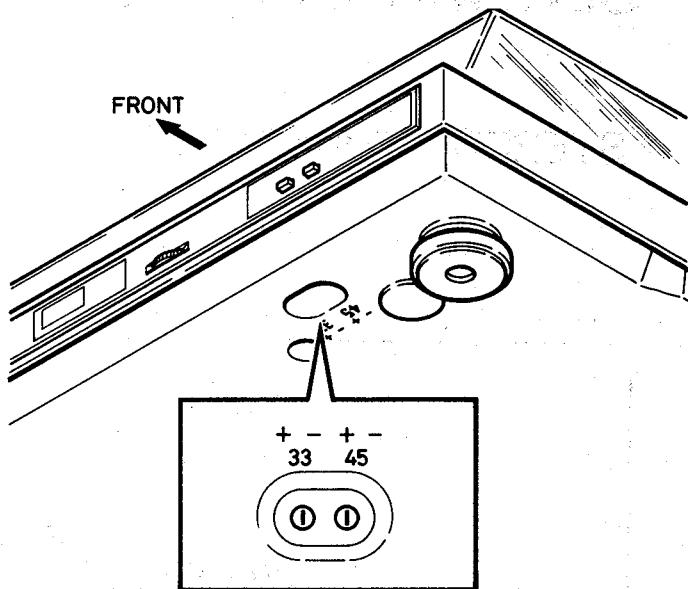
Motor	DC brushless servo motor
Drive system	Direct drive/Full auto
Speed	33-1/3 and 45 rpm
Speed deviation	±3.0%
Wow and flutter	0.05% (WRMS)
Rumble	-70 dB (DIN B spec)
Turntable platter	305 mm (12")
Tone arm	Static-balance straight type
Tracking error	±1.5°
Overhang	15 mm
Cartridge and stylus	Magnetic stereo cartridge (VM type) (No. MG-44J) and 0.6 mil diamond stylus (No. ST-44J)
Stylus pressure	1.25 g.
Frequency response	20 - 20,000 Hz
Channel separation	20 dB
Power source	AC 220V, 50Hz
Power consumption	8W
Dimensions (Approx.)	420 (W) x 360 (D) x 127 (H) mm (16-1/2" x 14-1/8" x 5")
Weight (Approx.)	4.5 kg (10 lbs.)

* Specifications subject to change without notice.

ADJUSTMENTS

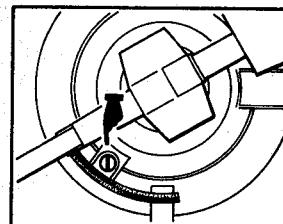
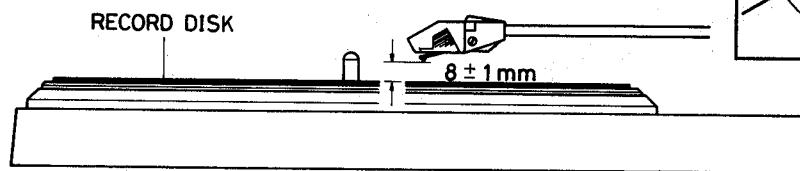
1. TURNTABLE SPEED ADJUSTMENT

1. Turn the pitch control knob left and right to set it approximately in the center.
2. Set the speed select button to the " 33 " position.
3. Insert a screwdriver into the " 33 " adjustment hole on the bottom panel and turn it until the stroboscopic lines appear to be stationary.
(When doing this, be sure to refer only to the row of lines which corresponds to the electrical power frequency in your area.)
4. Set the speed select button to the " 45 " position.
5. Insert a screwdriver into the " 45 " adjustment hole on the bottom panel and turn it until the stroboscopic lines appear to be stationary.



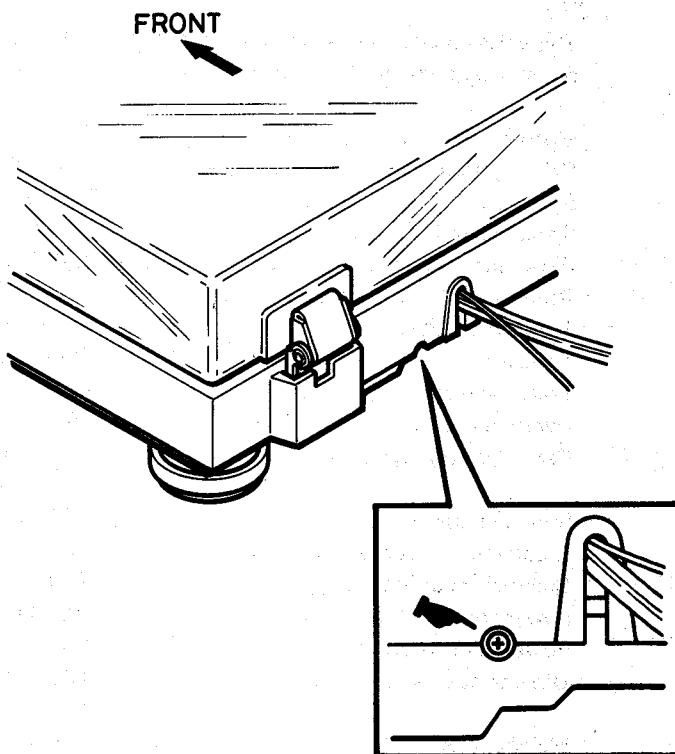
2. NEEDLE HEIGHT ADJUSTMENT

1. Press the UP-DOWN switch to set it to the Up position.
2. Use a screwdriver to turn the screw located at the bottom of the arm lifter and adjust the height of the cartridge needle from the surface of the disk to 8 ± 1 mm.



3. LEAD-IN ADJUSTMENT

1. Put test disk RG-325 on the turntable.
2. Set the speed select button to the " 33 " position.
3. Insert a Phillips screwdriver into the lead-in adjustment hole at the rear of the deck panel and adjust so that the cartridge needle fall on 17 ± 1 count position of the test disk when the START - STOP button is pressed for lead-in.
4. Set the speed select button to the " 45 " position.
5. Confirm that the cartridge needle fall on 18 ± 5 count position of test disk when the start button is pressed for lead-in. If the count is not within this range, repeat the adjustment from step 2.



MODIFICATION NOTICE



STEREO TURNTABLE

Date Feb. 25. 1985 Issued by _____

TP 440 (EUROPE) WM-13300

The following corrections should be made in the SERVICE MANUALS and PARTS(PRICE)LIST.

		Section	Key No.	Part No.	Description	Q'ty	Remark	Reason
1	From To	Mechanism	53	4-527T-18902 4-527T-18903	Motor Assy "			E
2	From To							
3	From To							

INTERCHANGEABLE	NOT INTERCHANGEABLE	Serial No. ChassisNo.	Effective from
Q'ty of initial production before modification.		Identification of modified unit.	

REASON FOR MODIFICATION			
A.....Standardization	C.....Improvement of reliability	E.....Misprint	G.....
B.....Change of materials	D.....Improvement of performance	F.....Registration	

SERVICE MANUAL

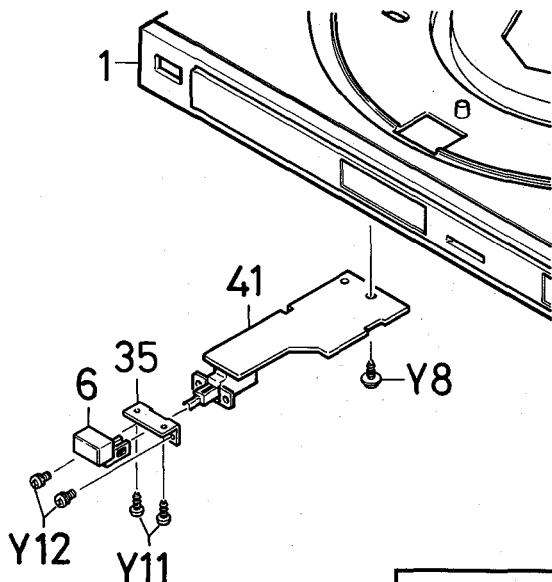


STEREO TURNTABLE

TP440(BK)
(EUROPE)

Only parts changed from Model TP440 are indicated below. For other parts, refer to service manual for Model TP440 (WM-13300)

Ref. No.	TP440	TP440 (BK)	Description	Remark
	PACKING & ACCESSORIES 141-6-133T-57100	141-6-133T-57101	INNER CORR CASE	
1 9 17 26 29 35	CABINET & CHASSIS 141-0-121T-19800 141-2-251T-08601 141-0-120T-00500 141-2-247T-27601 141-2-445T-26600	141-0-121T-19801 141-2-251T-08600 141-0-120T-00530 141-2-247T-27602 141-2-445T-26601 141-2-310T-99600	DECK PANEL ASSY HINGE, DUST COVER SUB PANEL ASSY SHEET, ARM BASE RUBBER CUSHION, DUST COVER BRACKET, POWER SW MTG	
Y11 Y12	FIXING PARTS —	BJN2S++3+8+Z1 BJX2S++3+6+Z1	S T PAN H 3 x 8 Z1 S M PAN W/SPRING WAS 3 x 6 Z1	
41 C1,2 or	P.C.B. ASSY, AC POWER 4-223T-12100	4-223T-12100 4-223T-12280	CAPACITOR	
43 CNP1 CNP2 C31 C41	P.C.B. ASSY, CONTROL 141-2-381T-04200 4-236T-24475 4-236T-24476 CE+16106MRHAF	141-2-381T-04202 4-236T-24477 4-236T-24478 CE+16226MRHAF CC+50223ZRZFF	BRACKET, FUSE PLUG (5→7p) PLUG (6p→7p) ELECT 22μ 16V MR HA F CERAMIC 0.022μF 50V Z R ZF	
45 C51 R65	P.C.B. ASSY, OUTPUT 4-280T-53200	141-4-280T-53200 CC+50103ZRZFF RC/+6332JT+++	P.C.BOARD ASSY, OUTPUT CERAMIC 0.01μF 50V Z.R.ZF CARBON 3.3K OHM J 1/6W	



Add this sheet to Model TP440 service manual.

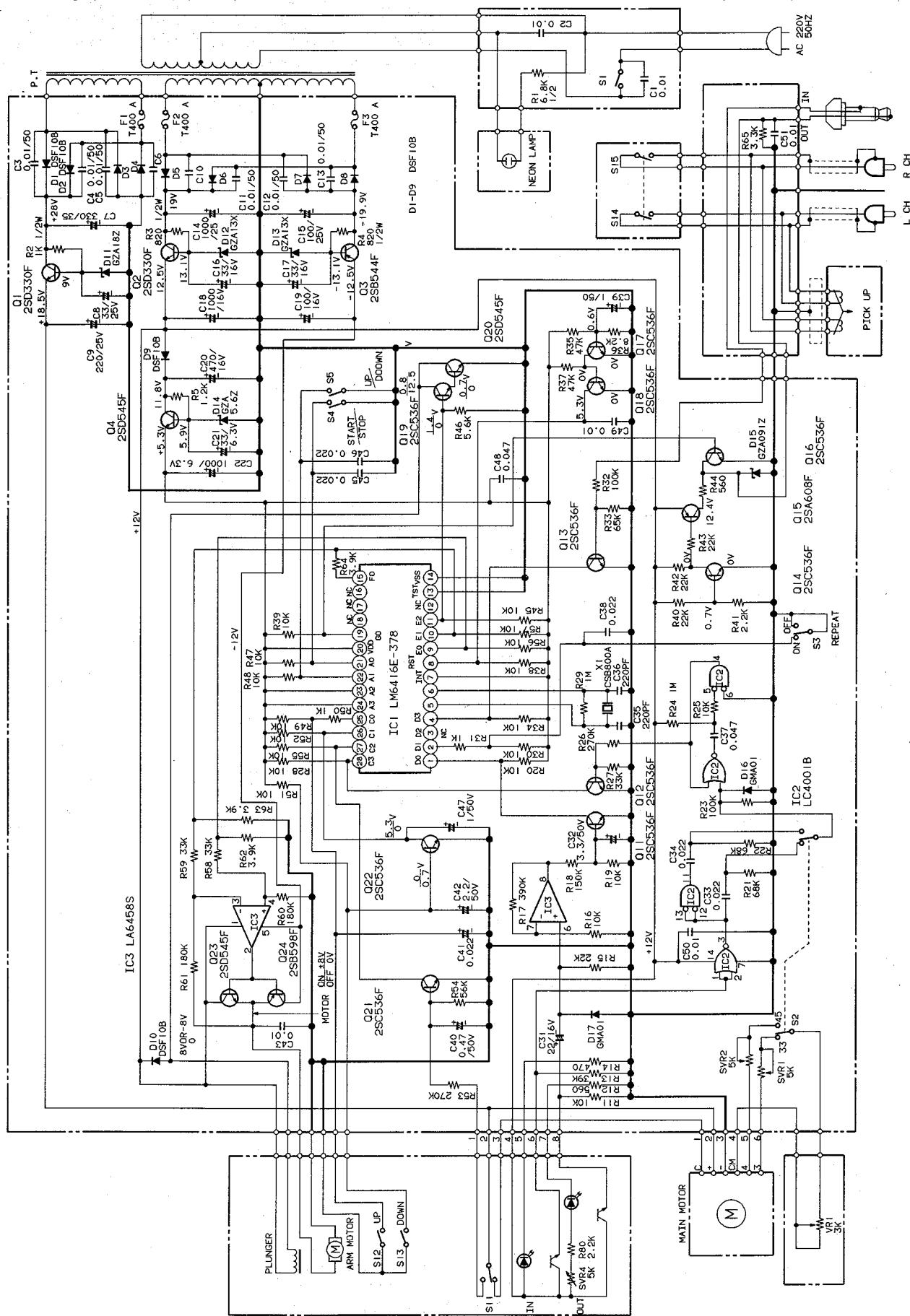
SANYO ELECTRIC TRADING CO., LTD.

33, Hiyoshi-cho 2-chome, Moriguchi-shi, Osaka-fu, 570 Japan.

Mar./'85/2200/KM Printed in Japan.

WM-14686

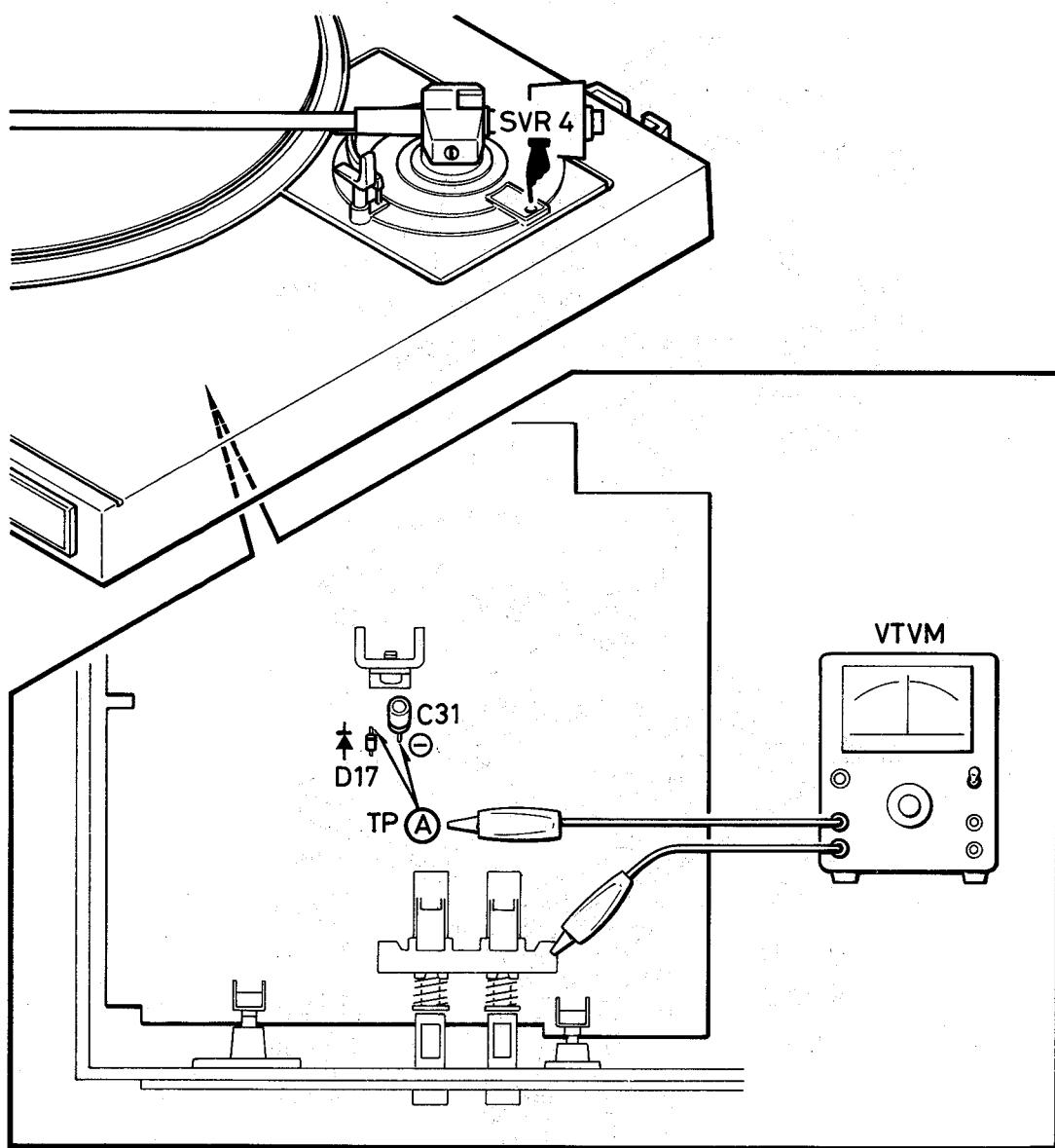
SCHEMATIC DIAGRAM



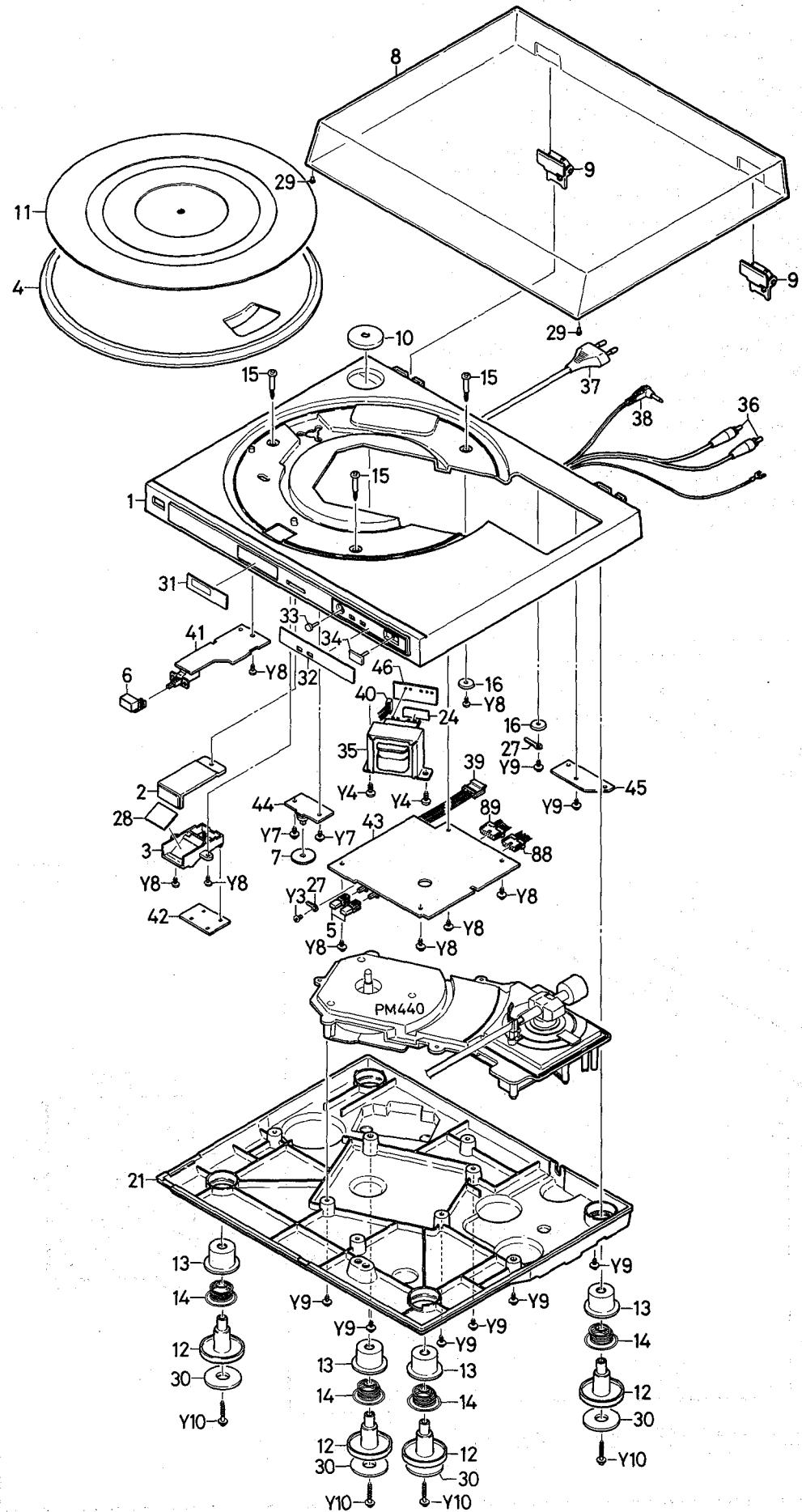
ADJUSTMENT

4. AUTO-RETURN ADJUSTMENT

1. Set the speed select button to the " 33 " position.
2. Put test disk RG-652 on the turntable. If the tonearm does not automatically return when the cartridge needle traces the 3-mm pitch grooves at the innermost circumference of the disk, connect an oscilloscope to TP (A) and adjust SVR4 observing the signal. Confirm that the TA (A) voltage at this time rises from 250 mV to 300 mV.
3. Set the speed select button to the " 45 " position.
4. Put test disk RG-653 on the turntable, trace the grooves with the cartridge needle, and confirm that the tonearm does not automatically cut. If the tonearm does not automatically cut, the voltage at TP (A) is 100 to 200 mV. If the tonearm automatically cuts, it indicates that the voltage at TP (A) is above 250 mV, so adjust SVR4 to bring the voltage down to 200 mV or less. After adjusting the voltage, play RG-652 once again to confirm that the tonearm auto-return is correct.



EXPLODED VIEW (CABINET).



PARTS LIST

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol \triangle in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with \triangle , use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.

Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

ELECTRICAL PARTS

NOTE:

* Materials of Capacitors are abbreviated as follows;

Elect,	Electrolytic Capacitor
NP. Elect,	Non-Polarized Electrolytic Capacitor
Mylar	Mylar Film Capacitor
Polypro	Polypropylene Capacitor
M. Polypro	Metallized Polypropylene Capacitor
TF	Thin Film Capacitor
EDL.....	Electric Double Layer Capacitor

* Tolerance of Capacitor, Resistors and Other parts are noted with follow symbols;

A	+75~10%	M	$\pm 20\%$
F	$\pm 1\%$	N.....	$\pm 30\%$
G	$\pm 2\%$	P	+100~0%
J	$\pm 5\%$	Z	+80~20%
K.....	$\pm 10\%$		

PACKING & ACCESSORIES

Ref. No.	Parts No.	Description
	141 6 144T 99300	FOAM PLASTIC CASE
	141 6 144T 99301	FOAM PLASTIC CASE
	141 6 133T 57100	INNER CORR CASE
	141 6 317T 76100	PAD, TOP
	141 6 317T 06700	PAD, RUBBER SHEET
	141 6 409T 07100	INST MANUAL
	141 6 231T 10100	INNER POLYE COVER
	141 6 231T 35400	INNER POLY COVER
	141 6 317T 81900	PAD, SET UP SIDE
	141 6 235T 60500	INNER POLYE LAMINA COVER

Ref. No.	Parts No.	Description
25	123 2 472R 01001	LUG
26	141 2 247T 27601	SHEET
27	123 2 472R 00600	LUG
28	141 2 863T 01500	MIRROR
29	141 2 445T 26600	RUBBER CUSHION
30	141 2 447T 71000	CUSHION
31	141 2 247T 27600	SHEET, STROBO
32	141 2 247T 27700	SHEET, OPERATION
33	141 2 352T 67700	SPACER, UP/DOWN
34	141 2 352T 67800	SPACER, START/STOP

CABINET & CHASSIS

Ref. No.	Parts No.	Description
1	141 0 121T 19800	DECK PANEL ASSY
2	141 2 131T 46200	CLEAR WINDOW
3	141 2 210T 57900	BRACKET
4	141 2 118T 03100	TURN TABLE
5	141 2 160T 09700	PUSH BUTTON
6	141 2 160T 38901	PUSH BUTTON
7	141 2 163T 80632	ROTARY KNOB
8	141 0 194T 02400	DUST COVER ASSY
9	141 2 251T 08601	HINGE
10	141 2 352T 52500	SPACER
11	141 2 247T 09601	SHEET
12	141 2 174T 12300	STAND
13	141 2 445T 30900	RUBBER CUSHION
14	141 2 856T 38800	SPRING COIL
15	141 2 421T 52800	SPECIAL SCREW
16	123 2 453R 10500	PLASTIC WASHER
17	141 0 120T 00500	SUB PANEL ASSY
18	4 527T 26071	BRUSHLESS MOTOR
19	141 2 873T 00900	REST
20	141 2 873T 00700	REST
21	141 2 125T 34500	BOTTOM LID
22	141 2 872T 01100	LIFTER
23	141 2 856T 39100	SPRING COIL
24	141 6 479T 73600	LABEL

Ref. No.	Parts No.	Description
Y1	BJN2S2R6+6+ZK	S T PAN H 2.6X6ZK
Y2	BJN2S2R612+Z1	S T PAN H 2.6X12Z1
Y3	BJB2S++3+8+Z1	S T BIND H 3X8Z1
Y4	BJB2S++412+Z1	S T BIND H 4X12Z1
Y5	NJSNS++4++Z1	SQUARE NUT
Y6	BJAMU++4+6+CP	S M H LESS HEX SOCKET 4X6CP
Y7	BJX6S++3+6+Z1	S T WASHER H 3X6Z1
Y8	BJX6S++3+8+Z1	S T WASHER H 3X8Z1
Y9	BJX6S++312+Z1	S T WASHER H 3X12Z1
Y10	BJX6S++320+Z1	S T WASHER H 3X20Z1

Ref. No.	Parts No.	Description
35	\triangle 4 300T 85500	P.T
36	4 243T 20871	LEAD CORD
37	\triangle 4 243T 84973	POWER CORD
38	4 243T 34900	LEAD CORD
39	4 240T 77700	SOCKET
40	4 240T 83575	SOCKET

PART LIST

Ref. No.	Parts No.	Description
45	4 280T 53200	P.C BOARD, OUTPUT
46	4 280T 53300	P.C BOARD, RELAY

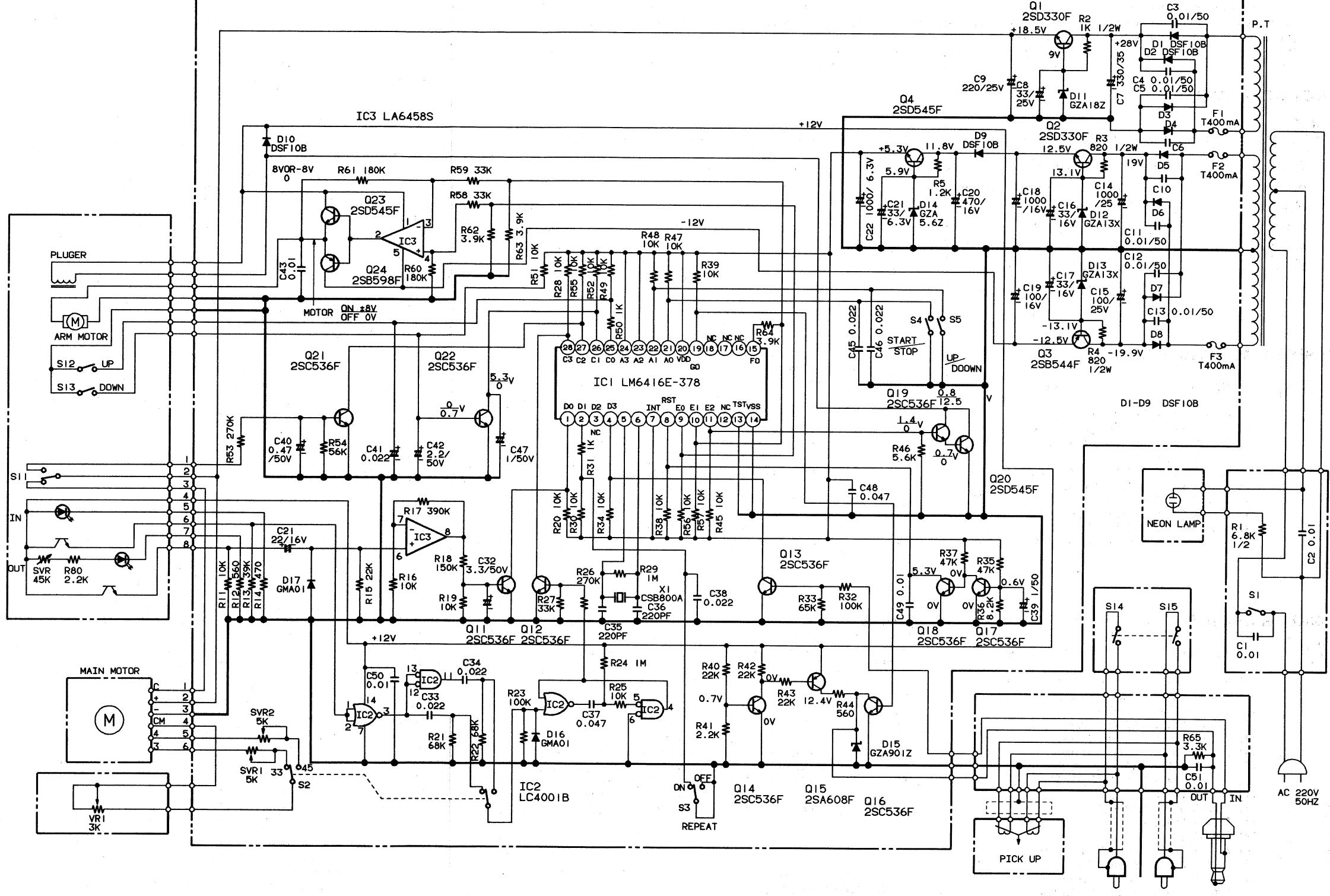
Ref. No.	Parts No.	Description
41	141 4 280T 52800	P.C BOARD ASSY, AC POWER
	141 2 382T 18900	TERMINAL
	4 237T 00100	TERMINAL BOARD
S1	\triangle 4 238T 70300	SWITCH
C1	\triangle 4 223T 12100	CAPACITOR
C2	\triangle 4 223T 12100	CAPACITOR
R1	\triangle RF+/+2682JSFP+	FP-CARBON S 6.8K J 1/2W

Ref. No.	Parts No.	Description
42	141 4 280T 52900	P.C BOARD ASSY, STROBO
	4 612T 07071	LAMP
	4 237T 00100	TERMINAL BOARD

Ref. No.	Parts No.	Description
43	141 4 280T 53000	P.C BOARD ASSY, CONTROL
	123 2 472R 00401	LUG
	123 2 472R 00600	LUG
	141 2 381T 04200	BRACKET FUSE
	141 2 368T 25000	HEAT SINK
X1	BJN2S++3+6+Z1	S T PAN H 3X6Z1
	4 266T 00100	CERAMIC RESONATOR
S2	4 238T 81500	SWITCH
S4	4 238T 81400	SWITCH
S5	4 238T 81400	SWITCH
SVR1	4 222T 97574	VR
SVR2	4 222T 97574	VR
CNP1	4 236T 24475	PLUG
CNP2	4 236T 24476	PLUG
F1	4 234T 01771	FUSE
	4 234T 10580	FUSE
F2	4 234T 01771	FUSE
	4 234T 10580	FUSE
F3	4 234T 01771	FUSE
	4 234T 10580	FUSE
IC1	SILM6416E+378	IC LM6416E 378 DIP28
IC2	SILC4001B++++	IC LC4001B DIP14
IC3	SILA6458S++++	IC LA6458S SIP9
Q1	STD330+F++++	TR 2SD330 F
Q2	STD330+F++++	TR 2SD330 F
Q3	STB544+F++++	TR 2SB544 F
Q4	STD545+F++++	TR 2SD545 F
Q11	STC536+F++U+	TR 2SC536 F AUD
Q12	STC536+F++U+	TR 2SC536 F AUD
Q13	STC536+F++U+	TR 2SC536 F AUD
Q14	STC536+F++U+	TR 2SC536 F AUD
Q15	STA608+F++++	TR 2SA608 F
Q16	STC536+F++U+	TR 2SC536

PARTS LIST & SCHEMATIC DIAGRAM

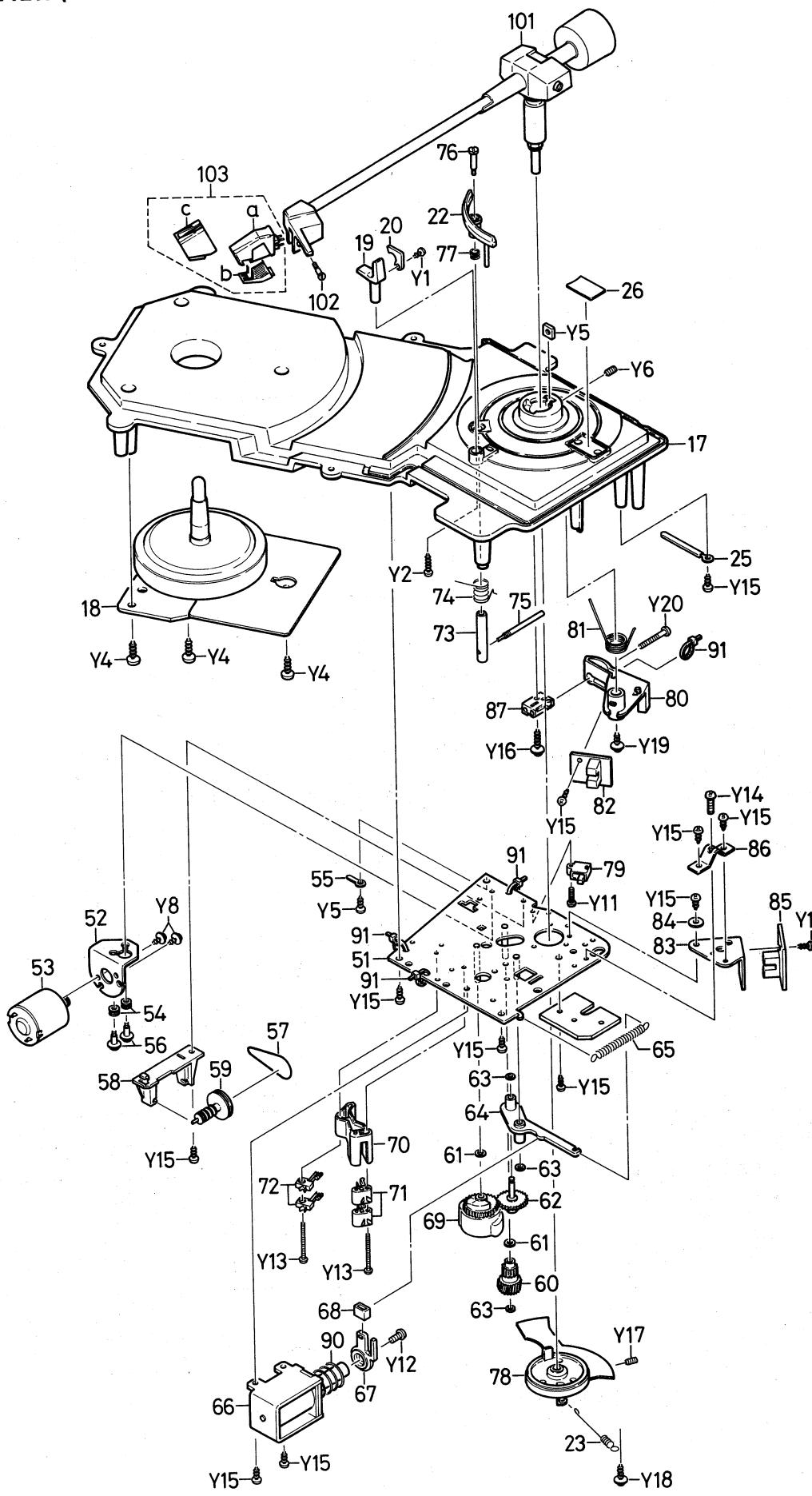
Ref. No.	Parts No.	Description
C50	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
C51	CC+50103ZRZFF	CERAMIC 0.01MF 50V Z R ZF
R2	RC/+2102JP+++	CARBON P 1K OHM J 1/2W
R3	RC/+2821JP+++	CARBON P 820 OHM J 1/2W
R4	RC/+2821JP+++	CARBON P 820 OHM J 1/2W
R5	RC/+4122JT++R	CARBON T 1.2K OHM J1/4WR25
R11	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R12	RC/+4561JT++R	CARBON T 560 OHM J1/4WR25
R13	RC/+6393JT+++	CARBON T 39K OHM J 1/6W
R14	RC/+4821JT++R	CARBON T 820 OHM J1/4WR25
R15	RC/+6223JT+++	CARBON T 22K OHM J 1/6W
R16	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R17	RC/+6394JT+++	CARBON T 390K OHM J 1/6W
R18	RC/+6154JT+++	CARBON T 150K OHM J 1/6W
R19	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R20	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R21	RC/+6683JT+++	CARBON T 68K OHM J 1/6W
R22	RC/+6683JT+++	CARBON T 68K OHM J 1/6W
R23	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R24	RC/+6105JT+++	CARBON T 1M OHM J 1/6W
R25	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R26	RC/+6274JT+++	CARBON T 270K OHM J 1/6W
R27	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R28	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R29	RC/+6105JT+++	CARBON T 1M OHM J 1/6W
R30	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R31	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R32	RC/+6104JT+++	CARBON T 100K OHM J 1/6W
R33	RC/+6563JT+++	CARBON T 56K OHM J 1/6W
R34	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R35	RC/+6473JT+++	CARBON T 47K OHM J 1/6W
R36	RC/+6822JT+++	CARBON T 8.2K OHM J 1/6W
R37	RC/+6473JT+++	CARBON T 47K OHM J 1/6W
R38	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R39	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R40	RC/+6223JT+++	CARBON T 22K OHM J 1/6W
R41	RC/+6222JT+++	CARBON T 2.2K OHM J 1/6W
R42	RC/+6223JT+++	CARBON T 22K OHM J 1/6W
R43	RC/+6223JT+++	CARBON T 22K OHM J 1/6W
R44	RC/+4561JT++R	CARBON T 560 OHM J1/4WR25
R45	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R46	RC/+6562JT+++	CARBON T 5.6K OHM J 1/6W
R47	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R48	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R49	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R50	RC/+6102JT+++	CARBON T 1K OHM J 1/6W
R51	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R52	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R53	RC/+6274JT+++	CARBON T 270K OHM J 1/6W
R54	RC/+6563JT+++	CARBON T 56K OHM J 1/6W
R55	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R56	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R57	RC/+6103JT+++	CARBON T 10K OHM J 1/6W
R58	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R59	RC/+6333JT+++	CARBON T 33K OHM J 1/6W
R60	RC/+6184JT+++	CARBON T 180K OHM J 1/6W
R61	RC/+6184JT+++	CARBON T 180K OHM J 1/6W
R62	RC/+6392JT+++	CARBON T 3.9K OHM J 1/6W
R63	RC/+6392JT+++	CARBON T 3.9K OHM J 1/6W
R64	RC/+6392JT+++	CARBON T 3.9K OHM J 1/6W
R65	RC/+6332JT+++	CARBON T 3.3K OHM J 1/6W



P.C.B. ASSY, VR

Ref. No.	Parts No.	Description
44 VR1	141 4 280T 53100 4 220T 19600	P.C BOARD ASSY, VR V.R

EXPLODED VIEW (MECHANISM)



PARTS LIST

TURNTABLE MECHANISM

Ref. No.	Parts No.	Description
51	141 0 311T 48300	CHASSIS ASSY
52	141 2 378T 16000	BRACKET MOTOR
53	4 527T 18902	COMMUTATE MOTOR ASSY
54	141 2 445T 08700	RUBBER CUSHION, MOTOR
55	123 2 472R 00401	LUG, MOTOR GND.
56	141 2 421T 36900	SPECIAL SCREW, BRACKET MOTOR
57	141 2 564T 34300	SQUARE BELT
58	141 2 210T 58500	BRACKET, PULLEY ASSY MTG.
59	141 0 661T 42420	PULLEY ASSY,
		REDUCTION MECHANISM
60	141 2 581T 36700	GEAR, REDUCTION
61	141 2 453T 30301	WASHER, GNW 3.1X5.4X0.25
62	141 0 581T 36800	GEAR ASSY, DRIVE
63	141 2 453T 30201	WASHER, 2.6X4.7X0.25
64	141 2 740T 16200	LEVER, SELECT
65	141 2 856T 38500	SPRING COIL, IDLER
66	4 264T 13400	MAGNETIC COIL, ARM DRIVE SELECT
67	141 2 740T 16300	LEVER, MAGNETIC COIL STOPPER
68	141 2 445T 31000	RUBBER CUSHION
69	141 2 581T 36900	GEAR, LIFTER CAM
70	141 2 210T 58600	BRACKET, SWITCH MTG.
71	4 238T 83300	SWITCH, UP & DOWN
72	4 238T 83400	SWITCH, MUTING
73	141 2 754T 62400	SHAFT, LIFTER PISTON
74	141 2 852T 95000	SPRING WIRE
75	141 2 754T 62500	SHAFT
76	141 2 421T 52500	SPECIAL SCREW, LIFTER HEIGHT ADJUST
77	141 2 855T 14200	SPRING COIL, LIFTER HEIGHT ADJUST
78	141 0 551T 04000	IDLER ASSY, ARM LEVER
79	4 238T 83500	SWITCH, REST
80	141 2 740T 16400	LEVER, LEAD IN SENSOR MTG.
81	141 2 852T 95100	SPRING WIRE
82	141 4 280T 52600	P.C BOARD ASSY, LEAD IN SENSOR
83	141 2 290T 00100	BRACKET, RETURN SENSOR MTG.
84	141 2 453T 64200	WASHER, BRACKET (83) MTG.
85	141 4 280T 52700	P.C BOARD ASSY, RETURN SENSOR
86	141 2 853T 87800	SPRING PLATE, RETURN SENSOR ADJUST
87	141 2 210T 58700	BRACKET, LEAD IN SENSOR
88	4 240T 77500	SOCKET
89	4 240T 77600	SOCKET
90	141 2 856T 38600	SPRING COIL, LEVER (67) RETURN
91	141 2 464F 20671	FIXER
92	141 4 280T 52700	P.C BOARD ASSY, AUTO RETURN SENSOR ADJUST

P.C.B. ASSY, AUTO RETURN SENSOR ADJUST

Ref. No.	Parts No.	Description
92 SVR4 R80	141 4 280T 52700 4 222T 71174 RC/+4 222JP++R	P.C BOARD ASSY, AUTO RETURN SENSOR ADJUST SVR, 5KB CARBON, P 2.2K OHM J 1/4W

FIXING PARTS (MECHANISM)

Ref. No.	Parts No.	Description
Y1	BJNBS++2+8+Z1	S M PAN H 2X8Z1
Y3	BJNBS++225+Z1	S M PAN H 2X25Z1
Y4	BJSTS++312+Z1	S T PAN H 3X12Z1
Y5	BJB2S++3+8+Z1	S T BIND H 3X8Z1
Y6	BJB2S++310+Z1	S T BIND H 3X10Z1
Y7	BJAMU++4+6+CP	S M H LESS HEX SOCKET 4X6CP
Y8	BJC4S++2+3+Z1	2X3Z1
Y9	BJX6S++3+8+Z1	S T WASHER H 3X8Z1
Y10	BJBTS++325+Z1	3X25Z1

ARM ASSY

Ref. No.	Parts No.	Description
101	141 0 743T 09300	ARM ASSY
102	141 2 421T 54800	SPECIAL SCREW
103	4 157T 04101	CARTRIDGE ASSY
103A	4 157T 04100	CARTRIDGE
103B	4 156T 03600	NEEDLE CARTRIDGE
103C	141 2 135T 89500	COVER

P.C.BOARD ASSY. LEAD IN SENSOR

Ref. No.	Parts No.	Description
82	141 4 280T 52600	P.C.BOARD ASSY, LEAD IN SENSOR
	4 202T 51300	PHOTO INTERRUPTER
or	4 202T 51371	PHOTO INTERRUPTER
or	4 202T 51372	PHOTO INTERRUPTER
or	4 202T 51373	PHOTO INTERRUPTER

P.C.BOARD ASSY, RETURN SENSOR

Ref. No.	Parts No.	Description
85	141 4 280T 52700	P.C.BOARD ASSY, RETURN SENSOR
or	4 202T 50700	PHOTO INTERRUPTER
	4 202T 50771	PHOTO INTERRUPTER

SANYO ELECTRIC TRADING CO., LTD.
33, Hiyoshi-cho 2-chome, Moriguchi-shi,
Osaka-fu, 570 Japan.

WIRING DIAGRAM

